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**THE ROLE OF ECOSYSTEM SERVICES IN RURAL TOURISM:
EVALUATION OF CARRYING CAPACITY OF TOURISTIC DEST-
INATIONS IN ECOLOGICALLY SENSITIVE RURAL AREAS TO
PREVENT OVER-EXPLOITATION / AZ ÖKOSZISZTÉMA SZOL-
GÁLTATÁSOK SZEREPE A VIDÉKI TURIZMUSBAN: A TURISZ-
TIKAI DESZTINÁCIÓK ELTARTÓ KÉPESSÉGÉNEK ÉRTÉKELÉ-
SE A NAGY ÖKOLÓGIAI ÉRZÉKENYSÉGŰ TERÜLETEKEN
A TÚLHASZNÁLAT ELKERÜLÉSE ÉRDEKÉBEN**

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Abstract

Ecosystem services represent the direct and indirect benefits that people derive from ecosystems, and therefore they play an important bridging role in connecting human systems with ecological systems. Therefore, sustainable management of ecosystem services, the processes by which the changing environment produces resources, is essential particularly for those touristic destinations, which are located in ecologically sensitive areas. Conservation strategies, integrating the preserved natural and cultural values are essential for sustainable tourism and maintenance of touristic destinations in order to prevent overexploitation. We propose an ecosystem-centred holistic management structure for rural landscapes, which will enable regional planning strategists and tourism managers to protect rural touristic destinations from overexploitation and planning touristic business volumes ac-

cording to the carrying capacity of these destinations in an economically feasible way. This includes regional and local development of infrastructures taking into consideration the natural environment, biodiversity, establishing the permanent or temporary no-go zones in natural parks and reserves. The concept of carrying capacity is defined as “the capacity of an ecosystem to support healthy organisms while maintaining its productivity, adaptability, and capability for renewal”, which is fully adaptable for the tourism business, extended by the inherent socio-economical factors.

Key words: ecological cycles, ecosystem services, carrying capacity, cultural landscapes, stakeholder management, rural tourism

Összefoglalás

Az ökoszisztéma szolgáltatások mindazon direkt vagy indirekt előnyöket magukban

foglalják, melyeket az ember az ökoszisztémákból kinyerhet. Ezért az ökoszisztéma szolgáltatások egy nagyon jelentős összekötő szerepet játszanak az emberi és az ökológiai rendszerek között. Következésképpen, az ökoszisztéma szolgáltatások fenntartható menedzselése, környezetbarát hasznosítása, kulcsfontosságú különösen a nagy ökológiai érzékenységgű területeken lévő turisztikai célok esetében. A megőrzési és fenntartási stratégiáknak integrálni kell ezen turisztikai desztinációk lényegét képező természeti és kulturális értékek védelmét melyek nélkülözhetetlenek a turizmus fenntarthatóságában úgy, hogy lehetővé teszik a túlzott kihasználás elkerülését. Itt egy olyan holisztikus, sokrétű és ökoszisztéma-centrikus kultúrtáj menedzsment rendszert javasolunk, amely lehetővé teszi a regionális stratégiák tervezőinek és a turisztikai szakembereknek, hogy egy gazdaságilag is életképes módon tudják védeni

a vidéki turisztikai célokat a túlhasznált-ságtól építve az adott területek ökológiai eltartó képességére. Ez magában foglalja a természeti környezethez alkalmazkodó infrastruktúra-fejlesztést, a biodiverzitás védelmét, az időleges vagy permanens zárt területek („no-go zónák”) létesítését a nemzeti parkokban és rezervátumokban. Az eltartó képességet úgy definiáljuk, mint „egy ökoszisztémának az egészséges szervezetek létezését fenntartó képessége úgy, hogy produktivitását, alkalmazkodó és megújuló képességét nem veszíti el”. Ez a koncepció teljes mértékben alkalmazható a turizmusra is, kiegészítve a szociális és gazdasági tényezők figyelembe vételével.

Kulcsszavak: ökológiai ciklusok, ökoszisztéma szolgáltatások, eltartóképesség, kultúrtájak, stakeholder menedzsment, vidéki turizmus

JEL Kód: Q57; Q26; Q20

Introduction

The role of ecosystem services in rural planning and touristic destination management

Ecosystem services include all benefits, which mankind can obtain from ecosystems. These are intimately interconnected with ecological cycles, both natural and anthropogenic cycle processes. Ecological cycles are self-regulating processes that recycle the earth's limited resources - water, carbon, nitrogen, and other elements - which are essential to sustain life

The Ecocycle-based strategies in local and regional development originate from these processes in order to bring about a society with non-toxic and resource-efficient cycles. Understanding how local cycles fit into global cycles is essential to make the best possible management decisions to maintain ecosystem health and productivity for now and the future.

A vast international work programme run by 1300 researchers from 95 countries created the Millennium Ecosystem Assessment (MA) in March 2005, a report, which focuses on ecosystem services and how changes in them have affected and will impact upon the quality of life of mankind and threaten the ability of Earth to support future generations. The most comprehensive classification of ecosystem services according to the Millennium Ecosystem Assessment provides a functional view as follows (Fig. 1):

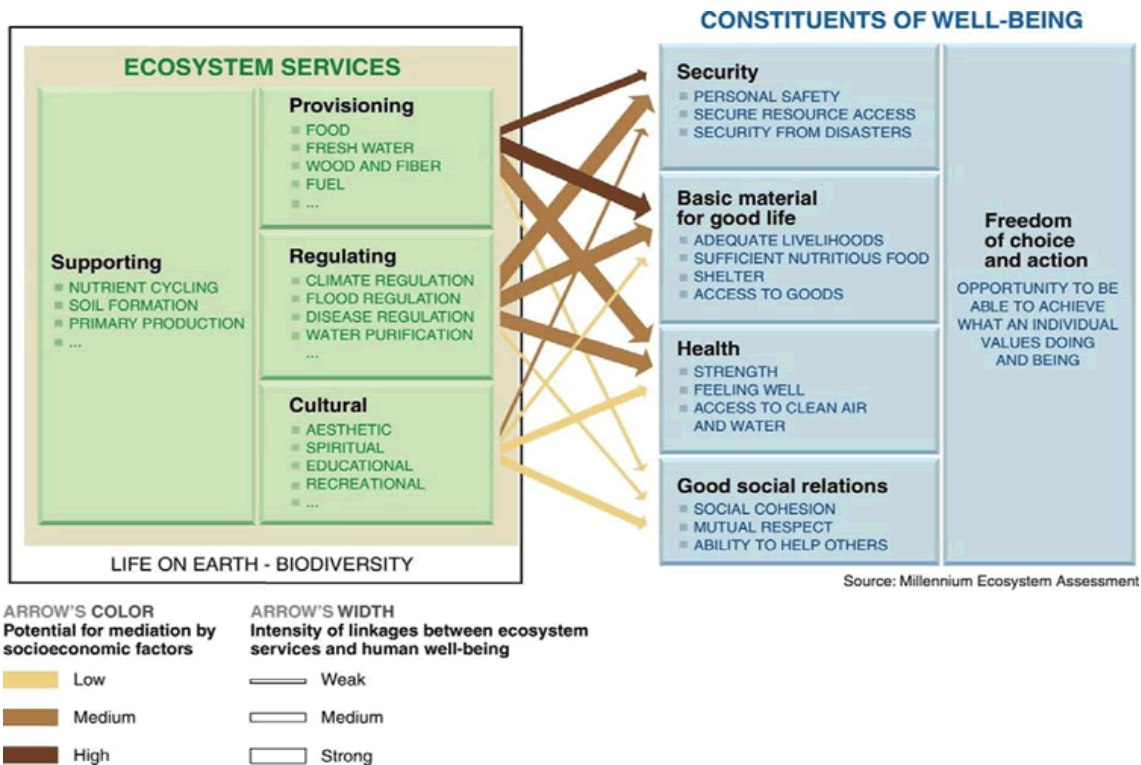


Figure 1. Connections between ecosystem services and constituents of human well-being according to the Millenium Ecosystem Assessment (2005)

Supporting services: These “overarching” services provide the basic conditions for the production of all other ecosystem services including soil formation, photosynthesis, primary production, nutrient cycling and water cycling, which constitute the most vital components of natural ecological cycles.

Provisioning services: All products obtained from ecosystems supporting the existence and well-being of mankind can be included here such as food, fibre, fuel, genetic resources, biochemicals, biominerals, natural medicines, pharmaceuticals, certain mineral resources, ornamental resources and fresh water;

Regulating services: The regulation of ecosystem processes in natural and semi natural or artificial ecosystems is of prime importance concerning the quality of ecosystem products and the functioning of ecosystems. Regulating services include all levels and constituents of ecosystems such as air quality regulation, climate regulation, water regulation, erosion regulation, water purification, disease regulation, pest regulation, pollination, natural hazard regulation;

Cultural services: A wide range of non-material benefits such as spiritual enrichment, cognitive development, reflection, recreation and aesthetic experiences obtained from ecosystems are considered as cultural services.

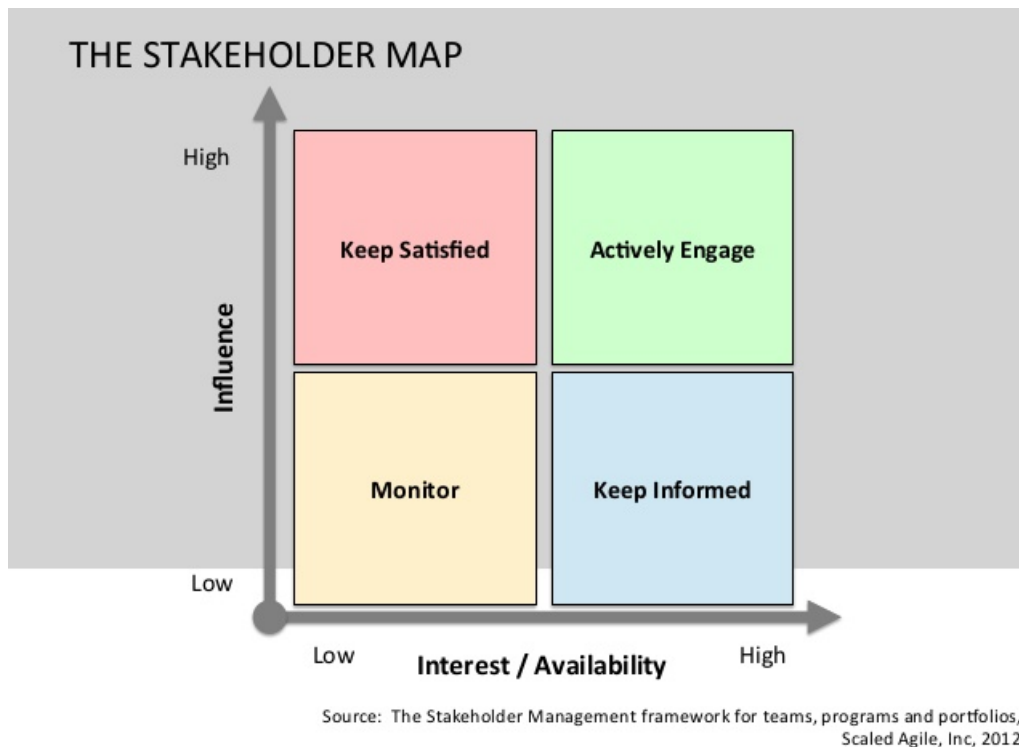


Figure 2. The Stakeholder Map or Staholder Power Grid Matrix illustrates the connection between influence/power and interest/availability.

However, regarding the cultural landscapes, special features of intellectual products, artistic creations, buildings and specially designed artificial ecosystems (agro-ecosystems, parks, botanical gardens, etc.) should be included in this category. Ecosystem services represent the direct and indirect benefits that people derive from ecosystems, and therefore they play an important bridging role in connecting human systems with ecological systems (Burkhard et. al. 2014; Fischer et al. 2012).

In rural planning, which in a wider sense includes planning of land use and assessment of available natural resources, the need of an ecosystem approach is particularly pronounced. Agro-ecosystem management programmes aim to reverse land degradation in order to generate local, regional and global environmental benefits resulting from a more productive and sustainable use of biodiversity and agricultural ecosystems. They respond to the need for concerted action among farmers, communities, districts in many ecologically sensitive areas to reverse the process of degradation and ensure the conservation and sustainable use of land, water and biological resources. Particular attention should be paid to the biodiversity of natural ecosystems and agro-ecosystem functions and the interaction between these ecosystems on which human livelihoods and food security depend. The goal of coordinated management of the natural resources through the widespread promotion and adoption of productive and sustainable land management techniques is to ensure economically and ecologically sustainable farming and food security.

This integrated management system has four prime components to be implemented on the basis of an integrated ecosystem approach (Némethy and Molnár, 2014):

- Enhanced regional collaboration, research, information sharing and monitoring;
- Enabling policy, planning and legislative conditions;
- Increased stakeholder capacity and knowledge at all levels for promoting integrated agro-ecosystems management;
- Adoption of improved land use systems and management practices generating improved livelihoods and environmental services.

Thus, handling stakeholder relations is one of the key factors of this integrated management system, since identification of stakeholders and the mapping of power structures will enable planners to assess the social viability of development projects. Therefore, the “mapping” of stakeholders to assess their capacity and knowledge and to estimate the social acceptance of development projects is of key importance. Such a stakeholder map, also called the stakeholder power grid matrix (Figure 1) based on the connection between power/influence and interest/availability will enable project managers to construct adequate social marketing plans, public education programmes, local and regional environmental policies, and legislative conditions for the population concerned in order to reduce their resistance to change and increase their environmental awareness.

Traditional agricultural landscapes evolved as tightly coupled social-ecological systems, such as strongly interdependent rural communities and local ecosystems (Bugalho et al. 2011, Fischer et al. 2012). Manmade, artificial and natural systems are intimately connected and typically developed over centuries, creating cultural and ecological settings that can be cumulatively termed ‘cultural landscapes’ (Plieninger et al. 2014). Traditional cultural landscapes contain rural societies, which are characterized by a high level of ecological knowledge and an often instinctive application of an ecosystem approach to assess the quality of the goods and services provided by ecosystems and to sustainably manage natural systems (Oteros-Rozas et al. 2013).

Furthermore, many traditional rural societies developed social behavioural patterns of individual and collective rules and norms in order to prevent shortage of critical resources in the community (Fischer et al. 2012, Sutcliffe et al. 2013). These good practices can successfully counterbalance or prevent the adverse impact of social, cultural, institutional and economic changes on cultural landscapes such as land-use intensification or land abandonment (Sutcliffe et al. 2013, Hartel et al. 2014). Sustainable rural planning based on sustainable management of natural resources and ecosystem services resulted in landscapes with high aesthetic, ecological, and cultural values (Plieninger et al. 2014). Environmental risk assessment must be carried out in connection with change of land use or infrastructural development with regard to internationally protected species, habitats or specific landscape elements, e.g., wood pastures, ecologically sensitive shallow lakes and surface watercourses (Némethy and Molnár, 2014), the built heritage, and scenic drive roads (Oteros-Rozas et al. 2013).

Recent studies suggest that exploring the cultural perceptions and preferences toward ecosystem services can be useful to identify the most relevant services to people (Martín-López et al. 2012, Plieninger et al. 2013) in order to understand how traditional

social-ecological systems navigate through the new challenges induced by globalization. Such an understanding is crucial to more realistically assess the limits and possibilities for conserving the rich cultural and ecological heritage in traditional cultural landscapes of rural areas. The limits of exploitation should be carefully evaluated and determined without compromising the economic sustainability of the area. Thus, the economic prosperity of the local population is as important as conservation strategies, since the success of such strategies often are depending on sustainable local economic development (Lagerqvist and Bornmalm, 2015), many times depending on tourism, since cultural landscapes are or may be converted into touristic products or contain particularly attractive touristic destinations. Prosperity measures based on the local traditions and resources might make a better contribution to conservation goals than traditional conservation strategies, by enabling the local people to stay in the area and maintain it themselves, often by revitalizing traditional trades and crafts and services for sustainably organized tourism. The ecosystem approach is essential for the preservation, successful maintenance and enhancement of cultural landscapes, which have to face a number of threats including both natural and anthropogenic factors. Particularly important risk factors and conflict sources are those, which can destroy or substantially change the appearance of the rural landscape and accessibility to ecosystem services and include alteration of traditionally shaped, agricultural sites impaired access to water (riverbanks, lake shore and marine coastal areas) and conflict between exploitation and conservation. Particular attention should be paid to the biodiversity of natural ecosystems and agro-ecosystem functions on which human livelihoods and food security depend. The goal of coordinated management of the natural resources of rural landscapes through the widespread promotion and adoption of productive and sustainable land management techniques is to ensure economically and ecologically sustainable farming and food security. This integrated management system has five components to be implemented on the basis of an integrated ecosystem approach:

- Enhanced regional collaboration, research, information sharing and monitoring;
- Enabling policy, planning and legislative conditions;
- Increased stakeholder capacity and knowledge at all levels for promoting integrated agro-ecosystems management;
- Adoption of improved and suitably diversified land use systems and management practices generating improved livelihoods and environmental services;
- Development of rural tourism, agro-tourism and ecotourism facilities in order to enhance local production of agricultural goods and services.

Sustainable rural tourism and the carrying capacity of rural destinations

Sustainable tourism is travel and local/regional hospitality services designed to minimize the impact of humans on the places they visit, encourage protection of both cultural heritage and the environment and provide long-term, socially just economic opportunities for local residents. Many rural cultural landscapes are important tourism destinations – or should become part of a sustainable tourism development. Economic, social and environmental aspects of sustainable development must include the interests

of all stakeholders including indigenous people, local communities, visitors, industry and government. Therefore the main focus within tourism development strategies should be the stay, services and activities at the destination and its surroundings within the framework of with each other compatible local, national and transnational strategies (Dinya, 2012), where cooperation between tourism organizations and authorities both on national and international level facilitates a sustainable tourism development (Manning & Dougherty, 2000; Némethy, 2013) taking into consideration the adverse environmental impact of mass tourism, tourism transport (access to destination and return travel, local mobility in the destination), carrying capacity (land use, biodiversity, tourism activities), use of energy, use of water, waste water purification, solid waste management, social and cultural development, economic development and institutional governance. Furthermore, many ecologically highly sensitive areas such as shallow lakes or parts of lakes and their watershed (marshlands, bird sanctuaries), coastal areas, karst landscapes, etc. are also protected areas, important resources for conserving biodiversity. At present approximately one tenth of the world's land surface is a protected area in some form. Sustainable utilization of these areas is determined by the perceptions/attitudes of fishermen, agriculture, local population and tourists who are the main users of natural resources and ecosystem services. Successful implementation of conservation policies, management measures and environmental education programmes requires consideration of those attitudes and resolution of the conflicts between humans and the natural environment. As identified by the IUCN protected areas have various management styles which include:

- Strict protection: a) strict nature reserve and b) wilderness area
- Ecosystem conservation and protection (i.e., national park)
- Conservation of natural features (i.e., natural monument)
- Conservation through active management (i.e., habitat/species management area)
- Landscape/seascape conservation and recreation (i.e., protected landscape/seascape)

Protected areas constitute the basis of the majority of conservation strategies, both nationally and internationally, in order to maintain natural ecosystems in an attempt to prevent threatened plant and animal species from becoming extinct. Therefore new protected areas need to be established in the future which will capture these threatened species. Tourism within protected areas is the vehicle by which park managers come into greatest direct contact with society, and it provides a rich opportunity for explaining park values, ensuring their ongoing existence and directly contributing to human welfare through the reflective and active recreation opportunities they provide.

Although tourism is a highly valued industry, which generates economical resources for the maintenance of rural touristic destinations, the touristic carrying capacity of these destinations should be assessed prior to planning activities in order to prevent the adverse environmental impacts of mass tourism. The concept of carrying capacity was initially introduced in biology to estimate the size of a species population, taking into consideration the environmental resistance indigenous to its location (Lein, 1993) or

“the capacity of an ecosystem to support healthy organisms while maintaining its productivity, adaptability, and capability for renewal” (Canadian Arctic Resources Committee, 2002). Regarding the aforementioned environmental issues of regional and local planning and environmental management, the carrying capacity of ecosystems has been defined as the ability of a natural or artificial system to absorb population growth or a given level of human activity without significant degradation (Maggi, 2010). Therefore, the tourism carrying capacity (TCC) approach has been developed for the tourism industry, particularly relevant for rural locations and destinations of high ecological sensitivity. The tourism carrying capacity has been defined by the World Tourism Organisation (WTO) as “The maximum number of people that may visit a tourist destination at the same time, without causing destruction of the physical, economic, socio-cultural environment and an unacceptable decrease in the quality of visitors’ satisfaction”. Linking economic and environmental considerations, rural tourist attractions are assets which cannot be reproduced and they should be treated, protected and allocated as scarce resources, to correct the adverse impacts of those market mechanisms, which do not show their normal allocative functions (Némethy et. al. 2016). Many touristic destinations are associated with mass tourism, large scale construction and infrastructure development, which can result in the destruction of these sites, creating hereby the paradox of short-sighted economies: the tourism destroys its own destination. Therefore, the key to planning and managing sustainable rural tourism is the assessment of the carrying capacity of ecosystems and the available ecosystem services of each touristic destination, taking into consideration the possible highest tourist-pressure in each season and constructing regulatory mechanisms to keep the environmental load within acceptable limits. For this purpose, we suggest a management model for sustainable rural tourism based on the assessment of the carrying capacity of ecosystem services (Fig. 3). The tourism carrying capacity should be considered at the three levels of policy formulation, detailed studies, and implementation and monitoring all based on assessment of ecosystem services (availability and use) and audit of natural resources (Figure 3). When applying the concept of ecosystem-based tourism planning and management, it must be taken into consideration that management applications will vary according to the geographical, ecological, political, social, economical and cultural conditions of the particular area (McIntyre, 1993). The carrying capacity concept should complement other management tools such as environmental impact assessments, land-use policies, tourism strategies and development plans (Fig. 3).

Since cultural landscapes are continuously changing due to environmental factors, social and economical development resulting in alterations of ecosystems and ecosystem services, research on tourism as a factor, which enhances these changes, should be focused not on the question “how much is too much?”, but rather on, “how much change is acceptable?”. Hence management focus is shifting from efforts to control numbers of visitors, to more quality-conscious management strategies that reflect a predetermined yet flexible set of environmentally, economically and socially desirable conditions. Thus, development of touristic products in rural regions will be influenced by the carrying capacity of ecosystems and the environmental impact assessment of tourism with particular emphasis on the protection of ecologically sensitive areas.

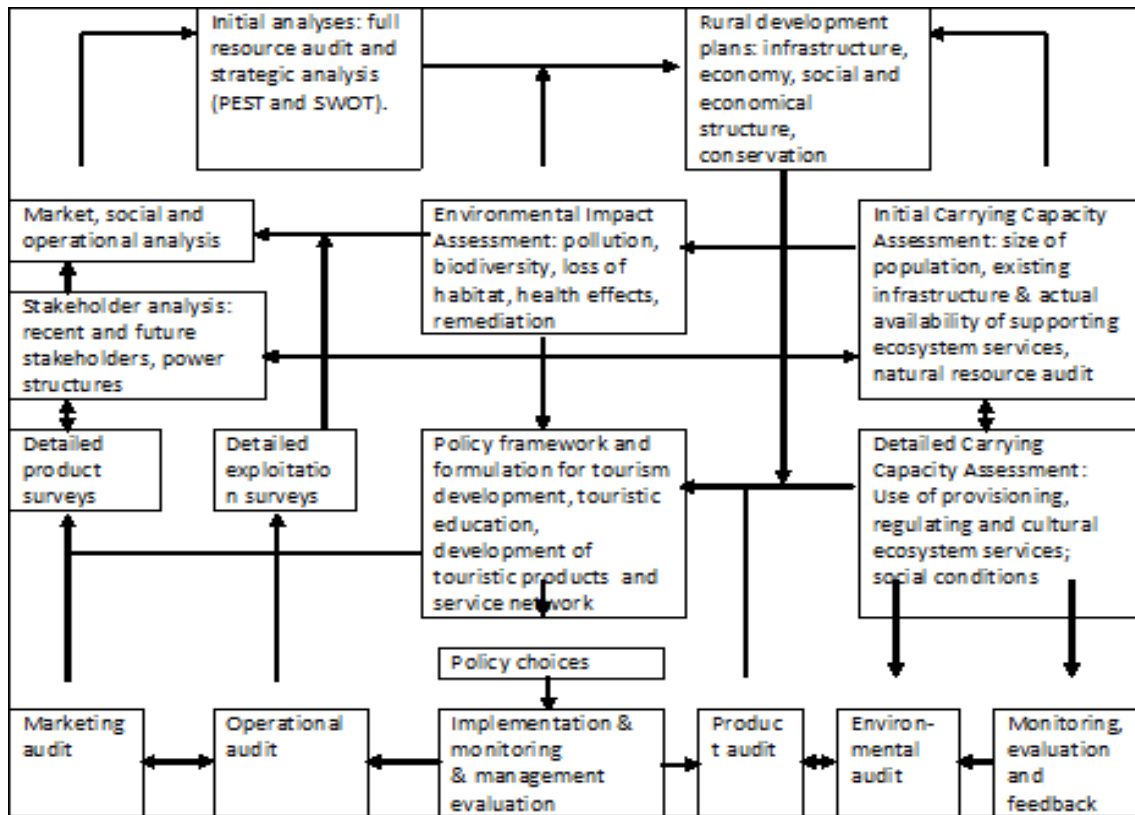


Figure 3. Management structure and sustainable tourism development based on carrying capacity and sustainable use of ecosystem services taking into consideration ecological cycle processes

The precautionary approach urges us to be especially concerned about tourism in protected areas, given the risk of damage and destruction to this unique natural resource. Therefore, tourism planning and development shall enhance economic opportunities without compromising the protection of the natural and cultural heritage and the quality of life of all concerned. It is also important to appreciate the educational value of tourism in protected areas, as this might become a great contribution to a paradigm-change increasing public consciousness for the protection of natural values (birding, eco-tourism, educational tourism) and cultural heritage.

Conclusions

A holistic integration of human activities, not disregarding the joint resources of overlapping areas of these activities, is imperative to use natural resources in the most effective and efficient way. Destination management shall be based on the ecosystem approach, taking into consideration even the built and intangible heritage of a cultural landscape. For a successful strategy, stakeholder analysis and stakeholder management plan is es-

sential, it is a prerequisite for strategic planning and the implementation of strategic plans considering the fact, that the power of certain key stakeholders and stakeholder groups may facilitate or block development or even environmental management plans regardless of their objectives if a real or assumed conflict of interests occur.

Management at micro and macro scales means the recognition that ecosystems exist on many scales, they are intimately interconnected and management should integrate efforts at different scales based on assessment of environmental risks, economical and social impacts of existing and planned human activities.

Well maintained ecosystem services will favour tourism development, particularly health, recreation and rural tourism and the educational aspects of special interest tourism. For the maintenance of ecosystem services, the touristic carrying capacity of rural landscapes must be assessed in order to determine the acceptable level of changes. It is important to keep in mind that cultural landscapes are continuously changing due to natural processes and social factors, and rural development strategies as well as tourism management plans should be applied in accordance with these changes.

Trade-offs can almost always arise between different ecosystem services, e.g., the enhancement of provisioning services typically causes the decline in many other ecosystem services. Therefore, these trade-offs should be made transparently and equitably.

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